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ABSTRACT

To help teachers understand the cognitive development that occurs as children learn to read, the Southwest Educational Development Laboratory (SEDL) has created The Cognitive Foundations of Learning to Read: A Framework. It describes the various cognitive domains that research has shown to be necessary for reading acquisition, and also illustrates the interrelationships that exist among these various cognitive domains. In addition to understanding what is important for all children learning to read, it is also important that teachers understand how to assess individual children's development in each of the cognitive domains the framework describes. To assist teachers in assessing their students' reading development, this paper describes common approaches for assessment for each of the cognitive domains outlined in SEDL's framework of reading acquisition. The paper states that this description of the various assessment techniques can be used to help teachers design their own classroom assessments, and may help teachers to better understand the district or campus assessments already being used with their students. The assessment approaches described in the paper focus on the cognitive development that research has shown to be important for developing early reading skills, but teachers are advised to use a broader sample of assessments to inform their instruction. Referring to the framework, the paper begins with the "top three" elements on the framework: reading comprehension, decoding, and language comprehension. It then moves to a description of assessments commonly used for the various cognitive domains that support language comprehension (background knowledge, linguistic knowledge, phonology, semantics, and syntax). Finally, it discusses assessment approaches commonly used for the cognitive domains that support decoding (cipher knowledge, lexical knowledge, phoneme awareness, letter knowledge, knowledge of the alphabetic principle, and concepts about print). (NKA)

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Methods of Assessing Cognitive Aspects of Early Reading Development.

by Sebastian Wren

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Methods of Assessing Cognitive Aspects of Early Reading Development

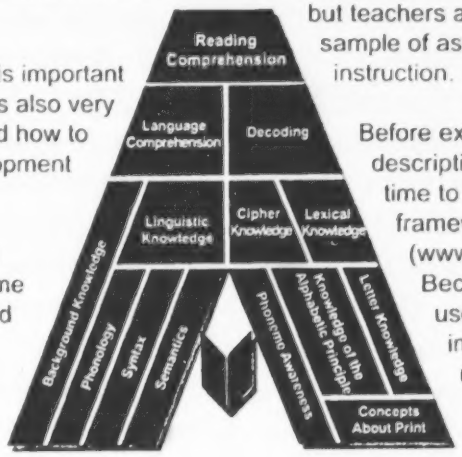
Sebastian Wren Ph.D.

If all children are to become successful readers, teachers need to become extremely sophisticated and diagnostic in their approach to reading instruction. To help teachers develop a sophisticated understanding of the cognitive development that takes place as children learn to read, SEDL has created The Cognitive Foundations of Learning to Read: A Framework (www.sedl.org/reading). This framework describes in some detail the various cognitive domains that research has shown to be necessary for reading acquisition, and it also illustrates the interrelationships that exist among these various cognitive domains.

In addition to understanding what is important for all children learning to read, it is also very important that teachers understand how to assess individual children's development in each of the cognitive domains described in the framework. Assessment should always inform instruction. Individual children come with such diverse backgrounds and skills that it is necessary to cater their instruction to their individual strengths. Ongoing assessment is necessary to discover each child's reading instruction needs.

There are a variety of approaches that can be used to assess early reading skills, and teachers should be familiar with the different approaches commonly used to assess early reading skill development. To assist teachers in their assessment of the reading development of their students, common approaches for assessment for each of the cognitive domains outlined in SEDL's framework of reading acquisition are described in this paper. This description of the various assessment techniques can be used to help teachers to design their own classroom assessments, and may help teachers to better understand the district or campus assessments that are already being used with their students.

Certainly "reading assessments" should not be strictly restricted to the cognitive development of each child -- it is important to also assess other, more affective aspects (such as motivation, enjoyment, interest and habit), as well as situational aspects (such as availability of appropriate literature and home support). The assessment approaches described in this paper focus on the cognitive development that research has shown to be important for developing early reading skills, but teachers are advised to use a broader sample of assessments to inform their instruction.



Before examining these assessment descriptions, it may be useful to take some time to familiarize yourself with SEDL's framework of reading acquisition (www.sedl.org/reading/framework). Because the framework provides a useful guide to inform both instruction and assessment, it makes sense to use it to inform the current discussion of assessment approaches.

Referring to the framework, we will begin with the "top three" elements on the framework, reading comprehension, decoding, and language comprehension. Then we will move to a description of assessments that are commonly used for the various cognitive domains that support language comprehension (background knowledge, linguistic knowledge, phonology, semantics, and syntax). And last we will discuss assessment approaches commonly used for the cognitive domains that support decoding (cipher knowledge, lexical knowledge, phoneme awareness, letter knowledge, knowledge of the alphabetic principle, and concepts about print).

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Reading Comprehension and the elements that support it

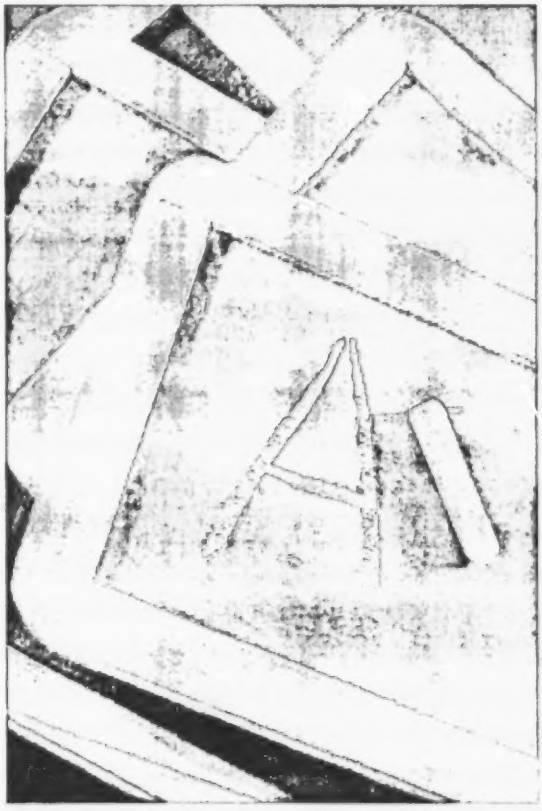
Reading comprehension is composed of two equally important components. Decoding, or the ability to translate text into speech, is only part of the process of reading comprehension. The other part is language comprehension, or the ability to understand spoken language. All struggling readers have difficulty with either language comprehension or decoding or both.

Reading comprehension assessments are the most common type of published reading test that is available. And the most typical type of reading comprehension assessment involves asking a child to read a passage of text that is leveled appropriately for the child's age or grade, and then asking some explicit, detailed questions about the content of the text (often these are called Informal Reading Inventories, or IRIs). While there are very many published IRIs, often teachers construct their own and use them to determine the appropriate instructional level for each child.

There are some variations on the basic reading comprehension assessment. For example, instead of explicit questions about facts directly presented in the text, the child could be asked to answer inferential questions about information which was implied by the text, or the child might be asked to retell the story in the child's own words or to summarize the main idea or the moral of the story. Another common reading comprehension assessment is called a "cloze" task – words are omitted from the passage, and the child is asked to fill in the blanks with appropriate words. Also, young children's reading comprehension can be assessed by asking them to read and follow simple instructions, such as, "Stand up" or, "Go look out the window."

Reading comprehension should not be confused with reading accuracy, another very common form of early reading assessment. In a reading accuracy assessment, a child is asked to read a passage of text clearly, without making any mistakes. The mistakes that the child does make are analyzed to find clues about the child's decoding strategies (not reading comprehension strategies). Very often, teachers attempt to assess a child's reading comprehension with a combination decoding/ reading comprehension task – the child reads a passage out loud while the teacher makes note of errors the child makes (sometimes called a "running record"), and then the child is asked some comprehension questions about the passage. This assessment strategy has some problems; children's reading comprehension often suffers when they are asked to read a passage of text out loud. When children read orally, they usually concentrate on reading accurately, and do not pay as much attention to comprehension of the content. Oral reading accuracy does give insights into decoding skills and strategies, but that is a separate test. A reading comprehension test is most accurate if the child is not reading aloud for an audience.

Reading comprehension assessments in this country are almost always written in English. The rare assessments that do exist for second language learners are almost always in Spanish. Because it is very important that children's reading comprehension skills be assessed in both English and in the child's primary language, whatever that language may be, teachers must be creative and



resourceful to find or create assessments that they can use with all of their children. Many children who are not proficient speakers of English have substantial literacy skills in their primary language, and teachers should endeavor to assess those skills and build upon them.

Language Comprehension

To read and understand text, a child needs to be able to understand language. Before expecting a child to be able to read and understand a story, the question should be asked, "Could the child understand this story if it was read TO her?" An essential aspect of language comprehension hinges on the ability to draw inferences and appreciate implications—it is important to understand both the explicit and implicit messages contained in language.

Language comprehension can be assessed in basically the same way reading comprehension is assessed. With language comprehension assessment, however, the child should not be expected to read any text. Everything from the instructions to the comprehension questions should be presented orally to the child.

It is also worth noting that a child's language comprehension "level" is usually considerably higher than her reading comprehension "level." A child that is not able to read and understand a passage of leveled, grade-appropriate text usually has no difficulty understanding ...at same text if somebody else reads it to her. For most young children learning to read, their ability to read and understand text is limited by their decoding skills, not by their language comprehension skills. (That is not to say that most children have "good" language comprehension skills or that language comprehension skills are not a reading teacher's concern. The point here is that decoding skills are usually the greater problem for young readers.) However, sometimes teachers find that a child who can not read and understand a passage of text also does not understand it when the teacher reads it to the child. It is always worthwhile to compare a child's language comprehension with her reading comprehension to be sure that her ability to understand text is not being limited by her ability to understand language.

When assessing the language comprehension skills of children with limited English proficiency, every attempt should be made to assess the child's language comprehension skills in both English and her primary language. A child's proficiency with a language, any language, is a strength that teachers should make every effort to build upon.

Decoding

Good readers are able to correctly pronounce familiar words, whether they are regular or irregular words, and are able to pronounce unfamiliar words in a way consistent with the conventions of written English. For skilled readers, decoding is so automatic that it requires virtually no conscious effort, so the reader can devote full attention to the task of comprehending the text.

As mentioned earlier, oral reading accuracy (a.k.a. "running record") is one form of decoding assessment, but it is not a very "clean" assessment. Teachers need to be aware that, in

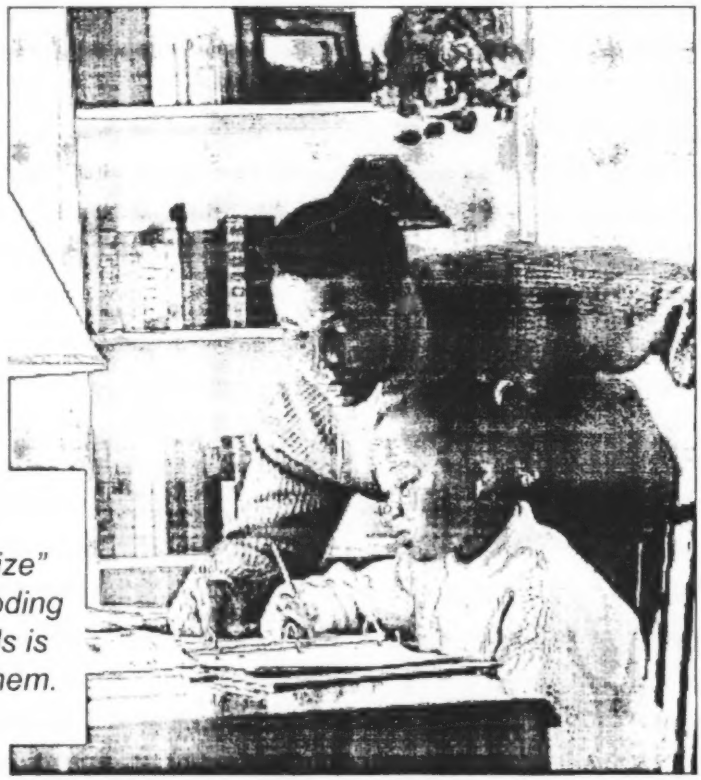
their early attempts to acquire reading skills, children apply many different strategies, some of which are hard to detect. Children often attempt to guess words based on the context or on clues provided by pictures – most of the time, a child's guesses are inaccurate, and their difficulties with decoding are revealed, but sometimes the child guesses correctly, making the teacher believe that the child accurately decoded the word. Teachers who use oral reading as a decoding assessment need to pay careful attention to the child as she reads – teachers should be aware that the child may appear to decode some words because those words are in the child's sight-vocabulary, and the child may appear to know other words when she is really just guessing.

A cleaner test of decoding skill is to determine the child's ability to read words out of context. Isolated words can be presented to the child one at a time, and the child can be asked to say the words aloud (this is not a vocabulary test, so children should not be expected to provide meanings for the words). The words selected for a decoding test should be words that are within the child's spoken vocabulary, and should contain a mix of phonetically regular and irregular words.

Similarly, children can be asked to match a spoken word with a written word -- the teacher can say a word or a word part orally to the child, and the child can identify the written form that matches the spoken word or word part.

Children can be tested on their accuracy (Is each word pronounced correctly?), their fluency (How much does the child struggle with word naming?), or their "level" – leveled lists of words are provided by many publishers, and the child can be assessed as to his or her ability to decode words that are of varying difficulties.

Sometimes teachers test children's ability to "recognize" sight words as a test of decoding skill, but "recognizing" words is not the same as decoding them. Decoding is a strategy that readers can use on all words, even words they've never seen before. Sight-word reading has to do with memorizing the "image" of a word or a specific feature of a word, and with this strategy, only a select few words are learned. All children go through a stage as they learn to read where they memorize a few sight words, and sometimes they are even encouraged by teachers who use Dolch word lists and frequency indexes to focus the child's attention on the most useful sight words. However, memorizing sight words does not help a child to learn how to decode words, and testing the child's knowledge of specific, well-practiced sight words does not provide a measure of his or her decoding skill.



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Elements Supporting Language Comprehension

Background Knowledge

In order to understand language, the child must have some background knowledge to use as a reference for interpreting new information. Moreover, if the child is expected to understand something specific, her background knowledge must be relevant to what she is expected to understand.

There are many assessments on the market that measure a child's general knowledge of facts about the world. Usually some estimation is made of what one could reasonably expect children in the first grade to know (e.g. birds build nests in trees, or bicycles have two wheels), and the child is asked to answer these simple "fact" questions (similar to what would be found on the old intelligence tests). However, the most informative assessment is a measure of the child's relevant background knowledge -- specifically, knowledge that is related to the task at hand. For example, if a child is expected to listen to and understand the story Charlotte's Web, the child should have some background knowledge about farm animals and spiders. Children know a great many things; children raised in the city, for example, know about public transit, taxis, traffic jams, shopping malls, and sky scrapers. Children raised in other settings know about other things. But any particular child may not know much about a particular topic. It is always worthwhile to assess a child's relevant background knowledge before expecting a child to be able to accomplish a task.

Linguistic Knowledge

Most of the problem of understanding language hinges on the knowledge of the mechanics of that language. All languages have structure, and an implicit knowledge of that structure is essential to language comprehension.

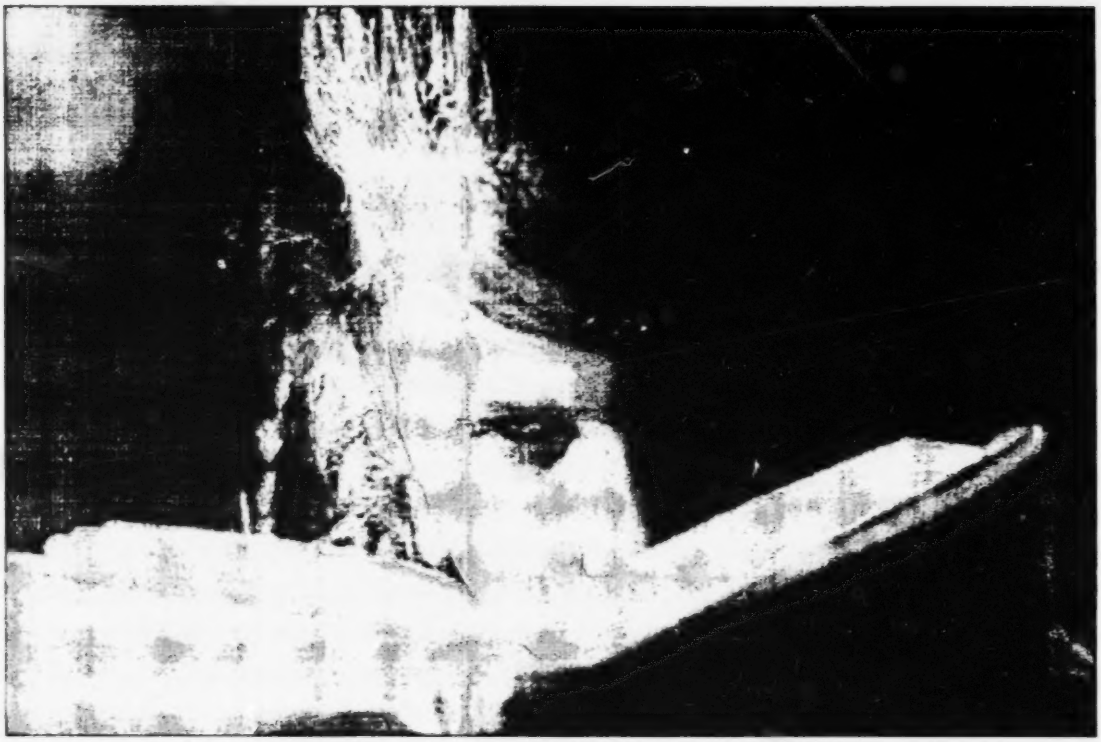
Linguistic Knowledge is the synthesis of three more basic cognitive elements -- phonology, semantics, and syntax. Linguistic knowledge is more than the sum of its parts, but it does not lend itself to explicit assessment. A child may have a grasp on the more basic cognitive elements, but still have trouble blending these elements together into a stable linguistic structure. For example, if a child appears to have a grasp of the more basic cognitive elements, but is still having difficulty expressing herself or understanding others, it is likely that the child has not yet managed to synthesize those elements. Similarly, children who have limited appreciation for genre or different voices in stories may be having difficulty synthesizing the more basic linguistic elements together. Or, children who communicate well informally, but who have difficulty with more formal linguistic structures (which are often found in classroom settings) may be having difficulty applying linguistic knowledge. An assessment of linguistic knowledge is less straightforward than other cognitive elements, and is often revealed through elimination of other possibilities.

Teachers should be careful not to confuse dialect differences with a lack of linguistic knowledge. Teachers should also know that, especially when considering a child's appreciation of genre, voice, and formal linguistic forms, children who primarily speak languages other than English may have more advanced linguistic knowledge in their native language than in English.

Phonology

Speech is the most typical form of language, and in order to understand speech, a child must be able to clearly hear, distinguish, and categorize the phonemes within the speech. A child who is unable to distinguish between similar phonemes may develop difficulties with language comprehension. A child who has difficulty with English phonology may not be able to hear the difference between words like THIN and FIN or HERE and HAIR, and those words may confuse the child when they come up in conversation.

The most common assessment for phonology involves discriminating between two words that sound similar. In this assessment, the child is asked to listen to the teacher say pairs of words and decide if they are the same word repeated twice (which sometimes, they should be), or if they are different words. When pairs of different words are presented, they should only differ by one phoneme (and they should be similar phonemes, such as /sh/ and /s/ or /d/ and /g/). Also, when



pairs of different words are presented, the location of the difference within the words should be varied (Sometimes the difference should be at the beginning, as in RHYME-LIME sometimes in the middle, as in MUD-MADE and sometimes at the end of the word, as in RIP-RIB). Also, attention should be paid to both vowels and consonants.

In a phonology test, the pairs of words do not have to be real words the child is familiar with. If a teacher wishes to make up a phonology test, she might find it easier to use made-up words. There is some merit to this approach because the child's attention is focused on the words themselves, and not on the meanings of the words.

Phonology is quite language specific, and children who speak languages other than English may be more "tuned" to the phonology of their native language. Similarly, teachers should be sensitive to the influence that dialect can play on a child's perceptions -- children who are raised immersed in one dialect of English may not be very sensitive to all of the distinct phonemes of other dialects of English.

Semantics

To understand language, a child must understand the meaning of word parts (a.k.a. morphology) and individual words within the language (a.k.a. vocabulary), but more than that, a child must understand that words are arranged in phrases, sentences, and discourse in meaningful ways. The child must understand how to use language to communicate complete and meaningful ideas.

Semantics is a general term that just refers to "meaning." Vocabulary specifically refers to the meaning of isolated words, and morphology specifically refers to the meaning of word parts, but semantics can generally be applied to the meaning of word parts, whole words, sentences and discourse.

There are several ways to assess semantics at each of these levels, but one common thread involves the question of whether the items on the test are presented in written form. If the child is expected to read the items, the test becomes more of a decoding test than a test of semantics.

Although the items should not involve printed text, it is very common to use pictures in semantics assessments (teachers should, of course, consider the cultural relevance and sensitivity of the pictures they use). A child might be asked to provide a name for pictures as a test of expressive vocabulary, or to match spoken words with pictures as a test of receptive vocabulary. A test of semantics at the larger-than-word level may involve asking a child to arrange a series of pictures to reflect a logical sequence of events.

Another common assessment involves asking a child to provide a word that best matches a definition presented (orally) by the teacher as a test of expressive vocabulary, or to ask a child to provide a definition of a word as a test of receptive vocabulary. Similarly, a test of vocabulary knowledge could require that the child be familiar with several words in order to answer each item correctly. For example, the child could be asked to select a word which does not belong in a group of words (e.g. THREAD, STRING, ROPE, KNOT). In this sort of assessment, the child must know the meaning of most if not all of the words in each item in order to be successful. Similarly, a child might be asked to provide a synonym or an antonym for words, which is a test of both receptive and expressive vocabulary. Again, in this case, more than one vocabulary word is being tested at a time – the child must know the meaning of the test item, and must know another word which either has the same meaning or an opposite meaning.

There are several ways to assess semantics at each of these levels, but one common thread involves the question of whether the items on the test are presented in written form. If the child is expected to read the items, the test becomes more of a decoding test than a test of semantics.

Morphology assessments often involve asking a child to describe how a word's meaning changes as parts of the words are changed. For example, a child could be asked to break compound words into their component parts and to describe the meaning of those component parts (e.g. DAY-BREAK, BASE-BALL, HEAD-ACHE). Or, a child could be asked to describe what happens when affixes are added to words (as in SKIP versus SKIPPED) and to explain those affixes (What do UNWRAP and UNTIE have in common?). Similarly, a child's appreciation of morphology can be assessed by asking the child to describe how words with similar parts are related (e.g. EARACHE, EARRING, EARDRUM).

Semantics assessments at the larger-than-word level usually depend on identifying words or sentences that do not make sense in the context (e.g. "Billy had a dog. He loved his dog. His fish was orange. His dog could fetch a ball."), or they depend on the child identifying logical inconsistencies (e.g. "Billy's dog could fetch and he could roll over. He was a good dog, but he didn't know any tricks.").

Syntax

Understanding isolated words is not adequate for the task of understanding language. All languages have rules regarding how words can be combined to form sentences, and an implicit understanding of the rules of sentence structure and phrasing is essential to language comprehension.

It is difficult to assess a child's syntactic knowledge without using printed text, but as was the case with semantics, if the child must process text to take the test, then the test becomes more of a decoding skills test than a test of syntax. It is possible to make some estimations about the child's productive syntactic knowledge by listening to the sentences that the child forms when she is talking, but teachers should be aware that the productive syntax may reflect the child's own dialect, which may follow non-standard syntactic rules, and may not reflect the child's ability to process and understand syntax in other dialects (it is common for people to speak one dialect, but be able to understand many other dialects).

A child can also be asked to identify sentences (spoken) that are syntactically incorrect (e.g. "Jane and her dog the hill they climbed it" or more subtly, "Me and Jane walked up the hill."), and additionally, the child can be asked to restructure the sentence correctly.

Another common syntax test involves presenting the child with sentences which have one word

omitted, and asking the child to suggest words that could fill the blanks. In this case, the meaning the word is not what is being evaluated, but instead, the child is graded based upon the syntactic appropriateness of the word. So, for example, the child may fill in the sentence, "Mary fell off of the ___" with any of several obviously appropriate words such as "chair" "house" or "wagon," but credit should be given for any noun that the child supplies (e.g. "leaf" "brain" or "mop") because they are all syntactically correct.

Another assessment of syntax involves the child's ability to combine simple sentences into complex sentences, and to add modifiers appropriately. So for example, "Brownies taste good" could be combined with, "Mary likes to eat brownies" to make the complex sentence, "Mary likes to eat brownies because they taste good." Similarly, children could be asked to appropriately insert the words, "brown" "big" and "quickly" into the sentence, "The spider ran up the wall" to make a more complex sentence such as "The big, brown spider quickly ran up the wall."

Similarly, a child's syntax can be assessed through a test of her ability to change tense and modifiers of sentences. For example, a child could be asked to restructure, "I went to the store" to the future tense.

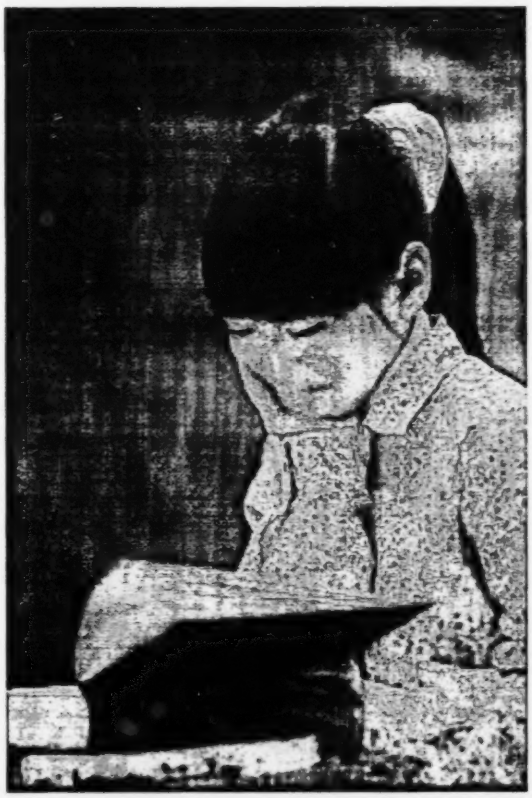
Elements Supporting Decoding

Cipher Knowledge

The relationship between the way a word is spelled and the way that word is pronounced in English is reasonably predictable. Certain conventions, collectively known as the English cipher, loosely govern English spelling and pronunciation. To be able to decode words, children need an implicit understanding of those conventions.

The best test of the child's ability to sound out regular words is to ask her to name isolated (out of context) words that are not already familiar to the child. Using unfamiliar words insures that the child is deciphering them, and not just recognizing them or guessing based on contextual cues. Some tests simply use real, regular words that are so rare that it is unlikely that the words are familiar to the child (e.g. PUN, MOCK, LOOT), but some tests use invented or made-up words (called pseudowords) to insure that the child does not have any prior experience with the test items (e.g. PARD, ORT, SERT). Some tests attempt to make the task more authentic by asking the child to read aloud a list of people's names (to pretend they are "calling roll"). The names are spelled phonetically and are not difficult to pronounce -- they can range from very easy names for young children (e.g. JIM WILLS, STAN HILL, etc.) to somewhat more challenging for older children (e.g. WANDA BOLTON, VICTOR CONRAD, etc.).

For young readers who are not quite able to sound out regular words, it is appropriate to test their basic letter-sound knowledge (which is a precursor to regular word reading). Common letter-sound knowledge assessments ask a child to identify a letter that could represent a speech sound (e.g. Identify the letter that makes the /s/ sound.), or ask the child to generate a sound or several sounds that could be represented by a letter (e.g. What sound(s) do(es) the letter "S" make?). In some assessments of letter-sound knowledge, the letters are embedded in the context of words, and the child is asked to identify the first letter (or sometimes the vowel sound) of a spoken word.



Lexical knowledge

Some words can not be easily sounded out because they do not follow the conventional letter-sound relationships – a child who attempts to sound out words like ONE and TWO will not arrive at the correct pronunciation. For these irregular words, the child will need additional information about correct pronunciation.

First a child learns to sound out words; then the child learns that when certain words are sounded out, they do not make sense. As we grow, and as we are exposed to more and more text, we learn new irregular words. As a child, you learned words like ONE, SHOE, and PEOPLE. As you read more, you learned words like CHOIR, COLONEL and ISLAND. Later still, you learned words like GEYSER, FEIGN, and BUREAU, and if you don't already know them, in the future, you may learn such words as SYNECDOCHE, BAREGE, and CACHET. In short, a person's ability to correctly read irregular words is directly related to their exposure to those words combined with information about the correct pronunciation (It is not uncommon for people to have read a word dozens of times, to know the meaning of that word, but to not know its correct pronunciation.).

Whereas a test of regular word reading (cipher knowledge) is strengthened by using words that the child is not familiar with, any test of irregular word reading (lexical knowledge) should use words that one could reasonably expect the child to be familiar with. This can be accomplished using leveled word lists, or by using words from previous vocabulary lessons, or by using words from the children's own leveled texts.

Once the words are chosen for an appropriate test of irregular word reading, the test can take one of several formats. The child can be asked to simply read the words aloud, or the child could be asked to find a word from a set that does not belong with the others (e.g. LINT, MINT, PINT). Similarly, the test might ask the student to find a rhyme for each regular word from a set (e.g. find the word that rhymes with CHOIR – CHAIR, CHORE, WIRE). Also, a test of irregular word reading could ask children to match pairs of words that have the same letter sounds (e.g. REIGN, SIGN, MINE).

Phoneme Awareness

One of the most basic building blocks of speech is the phoneme, and to gain knowledge of the alphabetic principle, a child must be consciously aware that spoken words are comprised of phonemes. Further, that child must be consciously aware of the fact that phonemes can be substituted and rearranged to create different words (e.g. SIGN and NICE both contain the same three phonemes).

Terminology can get very confusing when talking about speech sounds, but teachers should become familiar with these "phon" terms, and they should know how they differ from each other. We have already discussed phonology (the ability to discriminate between similar speech sounds in different words, such as HERE and HAIR). Now we will discuss two more terms -- phonological awareness and phoneme awareness.

Phonological awareness is a general term, and phoneme awareness is a specific term which is covered by the phonological awareness umbrella.

As such, there are many tests that can be described as phonological awareness tests, but only a few of those tests are specific enough to also be called phoneme awareness tests.

Phonological awareness tests measure the child's knowledge that words are made up of sounds (linguists call this a "metalinguistic" skill), while phoneme awareness tests are tests which examine the child's specific knowledge that words are made up of phonemes.

So, to test phonological awareness, one could ask the child to rhyme words (expressive) or to pick words that rhyme out of a set (receptive). The child's ability to rhyme reflects an appreciation of the sounds within words, and an implicit understanding that words are made up of sounds.

Similarly, the child's appreciation of alliteration (words that start with the same sound) can be tested. The child's ability to produce words that start with the same sound (e.g. what word starts with the same sound as the word MILK?), or the child's ability to match words based on alliteration (e.g. which words start with the same sound – MAN, MORE, FISH) also reflect the child's understanding that words are made up of sounds.

Children's awareness of the fact that words are made up of sounds can also be assessed through word length comparisons – a child is (orally) presented with two words, and is asked to determine which word is longer. This assessment is especially effective for young children if the phonemes of one word are contained within the second word (e.g. KING and KINGDOM or PIE and SPY – note that PIE and SPY have the same number of letters and are therefore equal length when written, but SPY has more phonemes and is therefore longer when spoken).

Another test of phonological awareness involves the child's ability to break spoken words up into parts – the child would say the word out loud, but would pause after saying each part. This type of task is called a "segmentation" task, and it can be used in a variety of ways. First, a child could be asked to segment compound words into their parts (as in "BASE (*pause*) BALL"). Similarly, a child can be asked to segment words into syllables (e.g. "PEN (*pause*) CIL"). Also, a child can segment the onset of the word (the sound or sounds before the vowel) and the rest of the word (sometimes called the "rime" – not to be confused with "rhyme"). In an onset-rime segmentation task, the words are almost always monosyllabic, and the child would say each word with a pause after the onset (e.g. "M (*pause*) OON")

The opposite of segmentation is blending, and every test of phonological awareness that involves segmentation can be reversed and used as a blending test. In a blending test, the teacher would say each word with pauses in the appropriate places, and the child would try to figure out what word the teacher is saying. Blending is usually much easier for children than segmentation.

Segmentation and blending techniques can also be used when testing phoneme awareness, but in a phoneme awareness task, the pauses would be inserted after each phoneme (either when the teacher segments the word or when the student segments the word). So in a phoneme segmentation task, a pause is inserted after each

phoneme (/sat/ ⇒ /s/ /a/ /t/), and in a phoneme blending task, a segmented word is blended together to make a whole word (/s/ /a/ /t/ ⇒ /sat/).

In addition to phoneme segmentation or blending tasks, there are several other phoneme awareness tasks that can be used to show that the child is aware of all of the phonemes in spoken words. For example, a child can be asked to count the number of phonemes in a word (e.g. how many phonemes are in the word PIN?), or a child may be asked to delete a phoneme from a word (e.g. What would PIN be if you took out the /p/ sound?), or add a phoneme (Add an /s/ sound to the beginning of PIN), or substitute a phoneme (replace the /i/ in PIN with an /a/ sound). Also, children can be asked to rearrange the sounds in a word (move the first sound of SIT to the end – Note, children who have been taught "Pig Latin" are particularly good at this task.).

Finally, children clearly have phoneme awareness if they are able to identify a phoneme in different words. Children should know that the words SAT and TOP both contain the /t/ sound, and that GAME and PLAY both contain the long /a/ sound.

Some of these phoneme and phonological awareness tasks are harder than others. Blending is easiest, but can be made more difficult if the word, when blended together, does not form a word that the child is familiar with (e.g. SAZ or VIKE). Segmentation is more difficult than blending, and becomes considerably more difficult if the word to be segmented contains consonant clusters (sometimes called digraphs -- e.g. MASK, SPIN or SLIP). Phoneme addition, deletion and manipulation -- the most difficult tasks -- are also made more difficult by creating words the child is unfamiliar with, and by adding consonant clusters.

Knowledge of the Alphabetic Principle

Spoken words are made up of phonemes, and written words are made up of letters. However, knowledge of those two facts is not sufficient for developing good decoding skills. Knowledge of the alphabetic principle refers to an understanding that the letters in written words represent the phonemes in spoken words.

A child's understanding of the alphabetic principle can be assessed very early, even before the child can accurately read or write simple words. The most direct approach is to ask the child to write words that you dictate – even if the child can not write the words accurately, her understanding of the alphabetic principle is revealed by whether or not she writes one symbol for each sound in the word. Young children often represent a whole word with a single symbol (Sometimes the symbol the child chooses is the first letter of the word, so a child might represent the word DOG with the letter D). This reflects their view that a word only exists as a representation of an object. Children who have an understanding of the alphabetic principle, however, will attempt to encode all of the sounds they hear in the word, although they may not use the right letters – in fact, they may not use letters at all. The child who has internalized the alphabetic principle may write the word BALL with three symbols, and ironically may represent the word BOX with four symbols (e.g. BOKS).

Similarly, children's knowledge of the alphabetic principle can be tested in other ways. Children can be presented with two words (written) – one long word and one short word. The teacher asks the children to pick the word they think she is saying (and she would say either a very long word or a very short word; e.g. HIP or HIPPOPOTOMOUS. The

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words can get closer in length as the child learns the object of the assessment.). Even if the children can not read yet, an understanding of the alphabetic principle will allow them to pick the right word.

Letter knowledge

The letter is the basic unit of reading and writing in English, and familiarity with the letters of the alphabet has consistently been shown to be a strong predictor of future reading success. While not sufficient in itself for reading success, familiarity with the letters of the alphabet is important for developing decoding skills.

Typically, testing a child's knowledge of the letters of the alphabet involves presenting the child with a page full of letters, and asking the child to name them. The page usually contains upper-case letters and lower-case letters, and a few odd characters like the two versions of the lower case "a" and the lower-case "g." This is not, however, the only approach to assessing letter knowledge.

Young children who do not know the letter names yet can be given a pile of manipulable letters and numbers and symbols and asked to separate the letters from the numbers and symbols. Similarly, children can be asked to "tell what they know" about each letter – they may not know the name of the letter, but they might know a sound that it represents or a word that starts with that letter. Children that know all the letter names can be further tested by their ability to separate the letters into upper- and lower-case groups, or to separate them into vowels and consonants.

Concepts about print

Understanding print involves recognizing and understanding the mechanics of text. A reader must understand that text contains a message; that it flows from left to right and from top to bottom; that individual words on the page correspond to individual spoken words, and so on. Written English has a structure, and understanding that structure is prerequisite to good decoding skills.

Again, a children's writing is a good way to reveal their understanding of the mechanics of text. Even children that are not writing well-formed letters can reveal what they know about print – very young children who have some experience with text "write" starting at the top, left corner of the page, writing in parallel, horizontal lines from left to right, and from the top of the page to the bottom of the page. The "words" the child forms are separated by spaces, and may even contain letter-like symbols. Sometimes children even insert some attempts at punctuation into their creations.

A teacher can also observe how the child handles a book, and can assess the child's knowledge about how information is presented in the book. A teacher can determine the child's general knowledge of books (Does the child know where the cover is? Does the child hold the book right-side-up? Does the child turn the pages appropriately? Does the child know that the message of the book is contained in the text?), and the teacher can gather knowledge about more specific details (Does the child have one-to-one correspondence between printed words and spoken words? Does the child know what a sentence is and what punctuation is? Can the child identify capital letters and lower-case letters?).

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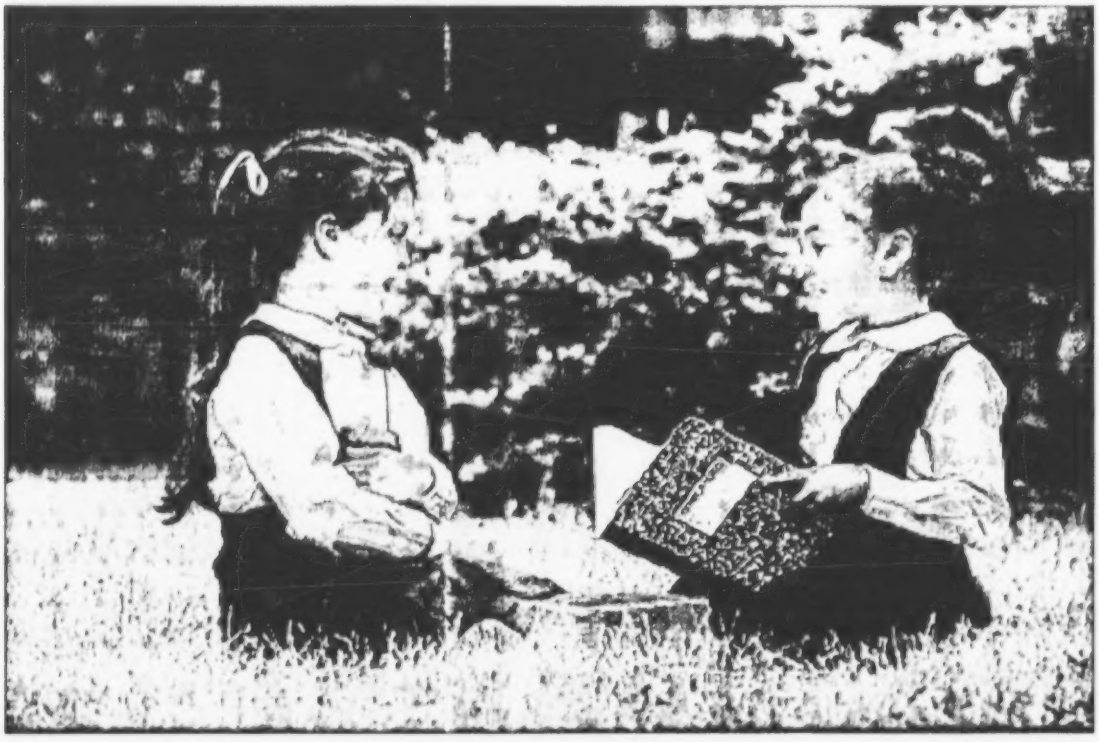
Summary

To quote Mark Twain, "There is more than one way to skin a cat," and as we've seen, a variety of different reading assessments can be used to measure the same cognitive domains through a wide variety of assessment approaches. Some approaches of assessment are better than others – some are more appropriate for young children, others more appropriate for older children. Often it is advisable to use several different assessment strategies when examining a child's cognitive development -- teachers are advised to use multiple measures for assessment of cognitive development, and not to rely on any single assessment. There are many options for early reading assessment available, and teachers should use their own judgment and discretion when developing assessment strategies for their students.

While it is quite important that teachers be familiar with the various different approaches that are commonly used for assessing the cognitive domains associated with reading development, what is critically important is that teachers know what to do with that assessment information. Good reading instruction is diagnostic, and good teachers use a variety of ongoing, formative reading assessments to help determine the instructional strategies they will use with individual children. SEDL feels that it is important that teachers develop their capacity for effective reading instruction, and is working to develop resources that can help teachers to:

- understand the process of reading acquisition
- assess individual student growth in reading, and
- use that assessment information to inform practice

The framework of reading acquisition that was mentioned at the outset of this paper is only one of many resources that SEDL is making available through our website (www.sedl.org/reading). SEDL has other resources that support effective reading assessment and reading instruction that teachers may find useful and informative, and new reading resources are being developed all the time. It is our hope that educators will use our resources to strategically and diagnostically address the reading instruction needs of each of their students.



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